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Is Intellectual Property a Hurdle for Transferring Technology to Developing Countries - If so, How High or a Hurdle

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Is Intellectual Property a Hurdle for Transferring Technology to Developing Countries? If so, How High of a Hurdle?

by CECILY ANNE O'REGAN*

I. Introduction

At the November 2003 Geneva Conference for the World Intellectual Property Organization ("WIPO"), Professor François Dessemontet said:

> When studying the impact of intellectual property on the development of nations and the transfer of technology, the famous motto 'the invisible hand' always comes to mind, as for most success stories. There is no absolute proof that intellectual property really increases the rate of economic development, as there is no proof that the private ownership of capital assets really led Japan and the Western world to their economic supremacy over the former Socialist countries. There can be no physical proof for the effect of law because laws are as patents, copyrights and trademarks, intellectual realities. The impact of any law is difficult to establish in a micro-sociological, let alone in a macro-economic view![1]

It is not surprising, therefore, that, depending on where you sit in the world, intellectual property rights are viewed as either a blessing

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1. François Dessemontet, Professor, Schools of Law of Lausanne and Fribourg, Address at the WIPO Geneva Conference (Nov. 17, 2003), http://www.wipo.int/documents/en/meetings/2003/wipo_wto/presentations/doc/dessemontet.doc.

or a curse. On the one hand, intellectual property rights are the mechanism which many believe drive the economies of developed countries by spurring innovation and ideas.[2] In fact, one of the first things a venture capitalist in Silicon Valley will ask when deciding whether to fund a start-up company is: what is the intellectual property position?[3] Consequently, the developed world views intellectual property rights as the proverbial keys to the shackles that bind less developed countries: if *only* they will believe and enact and enforce legislation to protect intellectual property rights.[4] "The principal assumption is that patents induce invention and disclosure that is socially beneficial, but which otherwise might not occur due to the free-rider problem."[5]

From the other side of the fence, intellectual property rights are viewed as a big stick that beats down the fragile economies in developing countries. In effect, the intellectual property rights appear as a glass ceiling that the developing countries cannot quite break through, but through which they have a tantalizing view of what might be: So close and yet so far.

Are intellectual property rights the hurdle to the transfer of technology to developing countries? Or are there other, more subtle, influences at work? Can other mechanisms be employed to encourage the transfer of technology to developing countries? This essay explores these complex questions.

II. Intellectual Property Rights

In order to understand the role intellectual property rights might take in impeding the transfer of technology to developing countries, it is important to understand what intellectual property rights encompass. Intellectual property rights take many forms: These

2. PATRICK H. SULLIVAN, VALUE-DRIVEN INTELLECTUAL CAPITAL (John Wiley & Sons 2000); DEPARTMENT FOR INTERNATIONAL DEVELOPMENT, THE UK GOVERNMENT RESPONSE TO THE REPORT OF THE COMMISSION ON INTELLECTUAL PROPERTY RIGHTS: INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY (2002), http://www.iprcommission.org/papers/pdfs/govt_response/govt_response.pdf.

3. How to Change the World, http://blog.guykawasaki.com/2006/10/how_to_change_t.html/ (Oct. 25, 2006).

4. Edmund Kitch, *The Patent Policy of Developing Countries*, 13 UCLA PAC. BASIN L. J. 166 (1994).

5. Thomas F. Cotter, *Market Fundamentalism and the TRIPS Agreement*, 22 CARDOZO ARTS & ENT. L.J. 307 (2004-05).

rights potentially protect everything from knowledge to identity.[6] Patents protect useful ideas by giving inventors the right to exclude others from making, using and selling their idea.[7] Patent rights are a *quid pro quo* exchange for the inventor placing information about the invention into the public domain. Even in developed countries, some would argue that a patent is not necessarily a fair exchange because some ideas can be ascertained by exposure to the invention with very little effort and without the need for a written description to place the information into the public domain. Even worse, questionable patents can ultimately increase the cost of innovation or provide a deterrent for innovation.[8] Nonetheless, although patents have been in and out of vogue over the years, patents are generally viewed as having an overall positive impact on innovation.[9]

Copyrights have a rich tradition in western culture and serve to protect original expressions by giving authors the right to control their original works of authorship and derivate works made from those works.[10] "Copyright is about sustaining the conditions of creativity that enable an individual to craft out of thin air . . . a Sun Also Rises, a Citizen Kane"[11] and the world is a richer place as a result. Part of the bargain with society for this government grant is that each of these rights is protected for only a limited time, and some uses that are socially beneficial are still permitted. Patent has a minimum term of 20 years as a result of the negotiations in GATT-TRIPs,[12] while copyright has a minimum term of 50 years.[13] Many would argue, however, that the term of copyright far exceeds the value of the work over the life of the copyright.[14]

6. *See* HM TREASURY, GOWERS REVIEW OF INTELLECTUAL PROPERTY 13 (2006), *available at* http://www.hm-treasury.gov.uk/d/pbr06_gowers_report_755.pdf.

7. *See, e.g.*, European Patent Convention, Oct. 5, 1973, 1065 U.N.T.S. 199; U.S. Patent Act, 35 U.S.C. § 1 (2000).

8. FEDERAL TRADE COMMISSION, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 1 (2003), http://www.ftc.gov/os/2003/10/innovationrpt.pdf.

9. *Id.* at 4.

10. *See, e.g.*, Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, 828 U.N.T.S 221.

11. P. Goldstein, *Copyright*, 38 J. COPYRIGHT SOC'Y U.S.A. 109, 110 (1991).

12. Agreement on Trade-Related Aspects of Intellectual Property Rights Annex 1C, Part II, § 5, art. 33. Apr. 15, 1994, 33 I.L.M. 1197 (1994).

13. *Id.* at Annex 1C, Part II, § 1, art. 12.

14. Tobias Schonwetter, *The Fallacy of Long Copyright Protection,* 1COMMONS, Apr. 3, 2007, http://icommons.org/2007/04/03/the-fallacy-of-long-copyright-protection/.

Additional intellectual property rights protect an enterprise's distinctive identity by providing protection to marks used on conjunction with goods or services under trademark law. In some countries, the design of a product or ornamentation can also be protected. Lastly, trade secret protection can be used to protect business information that has value to an organization because it is not generally known. A trade secret can encompass anything from business contact lists to the formula for Coca Cola®.

> The objective of any intellectual property system is two fold: knowledge dissemination and promotion of investment in knowledge creation and business innovation. First, it must promote the widespread dissemination of new knowledge by encouraging rights-holders to place their ideas and inventions on the market. Second, it must promote investments in knowledge creation and business innovation by establishing exclusive rights to use and sell newly developed technologies, goods and services.[15]

These objectives are the hallmark of the common elements of current intellectual property systems.

III. Technology Transfer Hurdles for Developing Countries

Intellectual property rights alone are not a hurdle for transferring technology to developing countries. Several other factors negatively impact a developing country's access to technology.

A. Cost

Even if strong intellectual property rights are available in a country, as a practical matter the cost of the goods or services may be prohibitive relative to the income of the people. This would hold true in many sectors but is frequently illustrated in both the pharmaceutical sector and the software sector.[16] "[M]ost observers . . . have concluded that it will take much more than strong patent rights to induce this type of research (i.e., research into diseases that are endemic principally to the developing world)."[17] In a simple economic model, goods and services are sold at a single price

15. Maskus, *Intellectual Property Rights and Economic Development*, 32 CASE W. RES. J. INT'L L. 471, 474 (2000).

16. Cotter, *supra* note 5, at 335.

17. *Id.*

that is determined by the market.[18] In real life, however, differential pricing is more common.[19] The difficulty arises, however, when the price differential becomes too great. Companies must constantly balance the cost of goods in a particular market against the potential backlash for the cost of goods in other markets. In the pharmaceutical industry, product differentiation—e.g., achieved by formulation changes—can be used to justify price differences, even if only semantically.[20] In the software sector, regionalization, which can occur by making a product available in a local language, typically is not sufficient to justify the cost differential or the backlash that would be seen in the major markets.[21] Regardless, companies cannot expect to distribute goods at a price charged in major markets of developed countries when the purchasing power of developing countries is ten to twenty times lower.[22]

B. Infrastructure

An obvious obstacle to technology transfer to developing countries is the lack of infrastructure in the form of technical skills and institutional support.[23] It is one thing to make technology available, it is quite another to have the tools necessary to exploit the technology. Furthermore, the "lack of governmental commitment to technological growth through inadequate funding and favorable policy has exacerbated the movement of skilled manpower from the South to the North (brain drain syndrome)."[24] Patents alone cannot be blamed for poor access to technology. For example,

> [p]oor countries' insufficient access to essential drugs has been blamed on the absence of crucial international humanitarian aide assistance in the area of health services . . . Though many of the African countries studied accord patent protection to pharmaceuticals, only few patentees of the 15 antiretroviral

18. Kevin Outterson, *Pharmaceutical Arbitrage: Balancing Access and Innovation in International Prescription Drug Markets,* 5 YALE J. HEALTH POL'Y L. & ETHICS 193, 203 (2005).

19. *Id.*

20. *Id.* at 207.

21. Catalin Cosovanu, *Piracy, Price Discrimination, and Development: The Software Sector in Eastern Europe and Other Emerging Markets,* 31 AIPLA Q.J. 165, 216 (2003).

22. *Id.* at 194.

23. Remigius N. Nwabueze, *What Can Genomics and Health Biotechnology Do for Developing Countries?,* 15 ALB. L.J. SCI. & TECH. 369, 389 (2004-05).

24. *Id.* at 390.

> treatments (used to treat AIDS) have actually patented their products in Africa . . . The result is that in some African countries . . . no patent protection was sought for any of the 15 antiretroviral treatments studied, yet there is still a serious problem of access to antiretroviral drugs in those countries.[25]

Patents do not operate in a vacuum. The usefulness of patents is dependent on their ability to provide protection in the market. A company will not invest in a patent unless it is obtaining value for that investment. Similarly, the per se absence of a patent will not prevent an otherwise patentable invention from being available, as evidenced by the access to retroviral drugs in Africa. Patents are typically obtained where a manufacturer believes it can get coverage that will exclude others from making, using or selling. In the case of Africa, there is little infrastructure available from which a company needs to protect itself from a competitor making a sophisticated medicament. However, there is also no real economy into which drugs can be sold.

C. Heavy-handed Enforcement

In order to get foreign direct investment, a country must have strong intellectual property rights enacted. Once those strong rights are enacted, however, individuals who once made a living selling counterfeit goods are displaced.[26] "For instance, in Lebanon, shortly after adopting a stronger IPR (intellectual property right) system, piracy and counterfeiting activities decreased while unemployment increased."[27] With these up-front costs to intellectual property reform, it takes a leap of faith to believe that there will be a pay-off in the end. Many developing countries may have a difficult time making that leap.

D. Compulsory Licenses

Some would argue that the fact that the TRIPs agreement allows compulsory licenses is an impediment to technology transfer to developing countries.[28] Although the rationale for compulsory licenses is laudable (i.e., enabling a country to issue a compulsory license at times of national emergency), it is not at all unlikely that

25. *Id.* at 401.

26. J. Homere, *Intellectual Property Rights Can Help Stimulate the Economic Development of Least Developed Countries,* 27 COLUM. J. L. & ARTS 277, 290 (2003-04).

27. *Id.*

28. Cotter, *supra* note 5, at 308.

the compulsory license provision would make a commercial enterprise reticent to make its patented products available for fear that a country would abuse its sovereign authority to issue compulsory licenses.[29] Another problem is that while parties to a license are in the best position to determine the value of a license, a governmental agency that institutes a compulsory license will be ill equipped to fairly determine a compensation rate for the intellectual property rights holder.[30]

Another drawback to compulsory licensing is the threat it would create to pricing in the home country.[31] For example, if a large pharmaceutical company had a compulsory license granted such that it was required to sell a patented medication for $10 per 100 pills, and that number of pills sold for $100 at home, in this age of nearly instantaneous transmission of information, the consumers in the home country would likely storm the gates and demand some price adjustment in their market. Large companies cannot afford this kind of pressure and bad press. As noted in an interview with Rene Bonvanie, Oracle's Vice President for Marketing, it would be "better [to] just give it away for free. This way you can at least get better public relations for the company."[32] Most companies would probably prefer the positive press of humanitarian efforts to the negative press of price differentials.

IV. The Existence of Intellectual Property Rights Alone is an Insufficient Incentive for Technology Development and Transfer

Even in developed countries, the existence of intellectual property rights is largely an insufficient incentive for technology development. The reality is that, for example, "biotechnology R&D is an expensive enterprise and only wealthy countries and corporations can afford the necessary investment."[33] It is for this reason that, notwithstanding the grant of intellectual property rights, governments in developed countries have devised a series of incentives to encourage research and development.

29. Alan O. Sykes, *TRIPs, Pharmaceuticals, Developing Countries, and the Doha "Solution,"* 3 CHI. J. INT'L L. 47 (2002).

30. Cotter, *supra* note 5, at 324.

31. *Id.* at 338.

32. Cosovanu, *supra* note 21, at 216.

33. Nwabueze, *supra* note 23, at 388.

A. Government Research

In most developed countries, it is estimated that 1 percent to 3 percent of a country's gross domestic product is spent funding research.[34] Research can be funded either by private companies or by the government. According to the National Science Foundation, in 1999 federal funding accounted for 22.5 percent of basic research funding in the United States.[35] In the U.S. following World War II, it was widely believed that information developed as a result of federal funding should remain in the public domain.[36] This belief did not change until the 1980s.

Some would argue, however, that government funding is not a requirement for economic growth and, in fact, is probably an impediment. Professor Kealey argued that "[w]ithout government funding of science, the United States overtook Britain around 1890 as the richest country in the world."[37] While Professor Kealey's provocative statement may be technically true, it is also true that the United States was a large country with vast, largely untapped, natural resources at the time and its success in overtaking Britain was likely impacted by other influences, such as its large and inexpensive immigrant work force, a societal tendency towards meritocracy, and simply being in the right place at the right time. Were the U.S. faced with today's two-gap theory, which "postulates that developing countries are unable to create and maintain the technological growth to promote economic development because they lack the necessary capital,"[38] the results may have been quite different. In fact, under current conditions, developing countries face a frustrating cycle where industrial imports often exceed agricultural exports, creating an unending cycle of debt.[39] This was not an economic reality faced by the U.S. in the late 1800s.

34. *See,* R&D in Knowledge-Intensive Economies, http://www.nsf.gov/statistics/seind08/c0/c0s3.htm.

35. Ronald L. Meeks, *Federal Funding Supports Moderate Growth for Basic Research in the 1990's*, NATIONAL SCIENCE FOUNDATION, Dec. 31, 1998, http://www.nsf.gov/statistics/databrf/sdb99319.htm.

36. David Hoffman, *A Modest Proposal: Toward Improved Access to Biotechnology Research Tools by Implementing a Broad Experimental Use Exception*, 89 CORNELL L. REV. 993 (2003).

37. Terence Kealey, *End Government Science Funding*, CATO INSTITUTE, Apr. 11, 1997, http://www.cato.org/dailys/4-11-97.html.

38. Homere, *supra* note 26, at 283.

39. *Id.*

Furthermore, while federal funding might provide a good foundation for research funds, it is also subject to the political whims of elected officials. Research that might be promoted under one political administration might be curtailed under another regime. Take for instance, the current limitations on stem cell research in the United States under the Bush administration's policies. It is not at all inconceivable that those limitations would be lifted under another politician's agenda. Many states in the U.S. have decided to fund stem cell research on the state level to overcome the lack of federal funding.[40] Even in Europe, there is a deep divide over the issue of stem cell research funding, with the U.K. on the side of funding and Germany opposed to funding.[41]

Although there is evidence to suggest government funding has a positive impact on research, there is also evidence to suggest that government funding is not a requirement for innovation. For example, University of Pennsylvania economist Edwin Mansfield has observed a correlation between the amount of money a company invested in pure science research and its overall productivity.[42] While logically it would seem that investing in pure science would take resources away from the corporate agenda and the bottom line, thereby reducing productivity, Mansfield has found the opposite: Investment in basic research had a positive overall impact on productivity for a company.

Nonetheless, as a practical matter, governments are answerable to their citizenry and subject to elections over longer periods of time. It can be argued that governments are more willing to fund high-risk research, provided that the research does not risk overly offending the moral sensibilities of a large voting block, or to fund research that is placed in the public domain to encourage derivative research.[43] Corporations, on the other hand, are generally intended to be for-profit enterprises and are answerable to shareholders on a quarterly

40. *California Gives Go-Ahead to Stem-Cell Research*, MSNBC.COM, Nov. 3, 2004, http://www.msnbc.msn.com/id/6384390/; Aaron Levine, *The Rise of State-Sponsored Stem Cell Research in the United States*, THE NEW YORK ACADEMY OF SCIENCES, http://region.princeton.edu/media/pub/pub_xtra_16.pdf.

41. *EU to Fund Embryo Stem Cell Research*, BBC NEWS, July. 24, 2006, http://news.bbc.co.uk/2/hi/europe/5209106.stm.

42. *Id.*

43. Nwabueze, *supra,* note 23.

basis.[44] It is generally difficult for a corporation, particularly a publicly traded corporation, to benevolently fund research that might be beneficial in the long term unless it is likely to add to the bottom line. As a result of this difficulty, in the United States the National Institute of Standards and Technology has an Advanced Technology Program that co-funds high-risk projects.[45] These high-risk projects are also recognized as having the potential for high return.

B. The Bayh-Dole Act – Providing Incentives for Commercialization by Putting Government Sponsored Research into Private Hands

Prior to 1980, federally funded research did not provide a clear path of ownership of intellectual property rights which impeded any attempt to commercialize the results of academic research and acted as a disincentive to obtain grant funding for anything that might be commercializable. With the passing of the Bayh-Dole Act in 1980,[46] universities, faculty inventors, and companies could use federal funds to engage in research and then transfer the results of their research to create companies, thereby creating jobs. An important feature of the Bayh-Dole Act was that it "created default ownership of patent rights for universities and allowed for exclusive licensing."[47] It should be noted, however, that the government retains limited march-in rights (e.g., in the event the technology has value and is not commercialized by the funded organization).[48] Such march-in rights, however, are rarely, if ever, exercised.[49] As a result of the Bayh-Dole Act, university technology transfer offices were created and the exploitation of government-funded research became a way for universities to increase their coffers. According to the Association of University Technology Managers (AUTM),

44. *See, e.g.,* David L. Scott, WALL STREET WORDS: AN A TO Z GUIDE TO INVESTMENT TERMS FOR TODAY'S INVESTOR (Houghton Mifflin Company 2003). An exception to this general rule is Benetech, a non-profit formed to create new technology solutions that serve humanity and empower people to improve their lives (http://www.benetech.org).

45. Funding Opportunities National Institute of Standards and Technology, http://www.nist.gov/public_affairs/grants.htm (last visited Nov. 18, 2008).

46. Bayh-Dole Act, 35 U.S.C. §§ 200-212 (2000).

47. Sara Boettiger & Alan Bennett, *The Bayh-Dole Act: Implications for Developing Countries*, 46 IDEA 261, 261 (2006).

48. Bayh-Dole Act, 35 U.S.C. § 203 (2000 & Supp. II 2002).

49. Boettiger & Bennett, *supra* note 47, at 276; Gregg S. Sharp, *A Layman's Guide to Intellectual Property in Defense Contracts*, 33 PUB. CONT. L.J. 99, 118 (2003).

> data from 222 institutions in the US and Canada, show that sponsored research expenditures rose by 16.6% in 2002, compared to 2001, while US patent applications increased by more than 13%. Licenses and options were up by more than 15%, while license-related income jumped by almost 12%.[50]

University licensing activities and the Bayh-Dole Act is not without its detractors. University technology transfer organizations are measured by the amount of revenue generated which, like a for-profit corporation, gives them incentive to turn research into a revenue stream.[51] This incentive can undermine a university's charge of representing the public trust by incentivizing the university to pursue technologies that are likely to be patentable and/or licensable.[52] These incentives may also trickle down to faculty who may be lured from the intellectual pursuits of fundamental research toward more lucrative, industrially applicable research.[53] Of concern in the U.K. is that that the pressure to patent results may inhibit the free exchange of ideas among colleagues.[54]

In a frightening statistic, less than 10 percent of health research funding is directed to diseases that affect 90 percent of individuals worldwide.[55] For instance, "though pneumonia and diarrhea (prevalent in developing countries) constitute "11% of the global disease burden," only 0.2 percent of the global research budget was spent in them in 1992.[56] At the university level, this could at least in

50. Managing Intellectual Property, *University Licensing on the Rise*, MANAGING INTELLECTUAL PROPERTY, Jan. 11, 2004, http://www.managingip.com/Article/1325974/University-licensing-on-the-rise.html.

51. Boettiger & Bennett, *supra* note 47, at 263.

52. *Id.* at 264.

53. *Id.* at 266.

54. *Keeping Science Open: The Effects of Intellectual Property Policy on the Conduct of Science*, THE ROYAL SOCIETY, Apr. 2003, http://royalsociety.org/displaypagedoc.asp?id=11403.

55. Steven Price et al., Helping Developing Countries Level the Playing Field, Address to the Global Forum for Health Research 8' Mexico (Nov. 2004), *available at* http://www.globalforumhealth.org/Forum8/Forum8-CDROM/OralPresentations/Price%20S%20F8-644.doc.

56. Nwabueze, *supra* note 23, at 387, (citing COMMISSION ON HEALTH RESEARCH FOR DEVELOPMENT, HEALTH RESEARCH: ESSENTIAL LINK TO EQUITY IN DEVELOPMENT (1990), *available at* http://www.ksg.harvard.edu/sed/docs/k4dev/chen_healthres_execsum _1990.pdf.

part be the result of a lack of incentive to work on basic research or research that cannot be translated into a potential income stream.[57]

Another fallout from the Bayh-Dole Act is restricted access to research tools.[58] Prior to the Bayh-Dole Act, methods and research tools that were developed under federal grants were rarely patented. These efforts were, instead, published in scientific literature and placed into the public domain.[59] Academics followed the adage "publish or perish," not "patent or perish." As a result, there were no restrictions on the use of, or access to, these methods and tools, which enabled further development. Currently, although a university may develop a highly useful research tool that it licenses to industry, that university will only generally retain a right to practice the invention within its own institution. Consequently, other universities are precluded from using the tool in their research without getting a license from the commercial partner. The commercial partner, being a for-profit enterprise, has no obligation to offer a license at terms that would be beneficial to another non-profit university.

In spite of its imperfections and arguably unintended negative consequences, the Bayh-Dole Act does, however, illustrate a mechanism whereby government sponsored research can be used to generate income and used to develop commercializable industry. Notwithstanding the criticisms, the Bayh-Dole Act has had an overall positive impact on research and economic development, at least in developing countries.

C. Orphan Drugs – Fostering Development of Much-Needed Drugs Through Incentives

Orphan drug acts, which are available in several developed countries, present an interesting approach to providing incentive to develop technology. Under an orphan drug act, a government can, for example, provide a variety of incentives to companies who perform research or spend resources developing drugs that otherwise might not be commercially viable. In developed countries, orphan drugs are typically categorized as drugs developed to treat diseases that affect a relatively small percentage of a population. Incentives can include tax benefits; granting additional rights, such as market exclusivity; and subsidizing clinical trial research.

57. Nwabueze, *supra* note 23, at 392.

58. Boettiger & Bennett, *supra* note 47, at 278.

59. Hoffman, *supra* note 36, at 1005.

In the United States, in 1983, Congress enacted the Orphan Drug Act to provide incentive for researching drugs to treat diseases and conditions that affect 200,000 people or fewer.[60] The European Union has a similar incentive program administered by the Committee on Orphan Medicinal Products of the European Medicines Agency.[61] The European program is designed to provide incentives to develop drugs for diseases with a prevalence of less than 5 per 10,000 in a community, or for which "drug marketing would be unlikely to generate sufficient returns to justify investment."[62]

Since the enactment of the Orphan Drug Act in the United States, over 1100 different orphan drug designations have been granted by the Office of Orphan Products Development ("OOPD") and over 250 orphan drugs have received marketing authorization.[63] In contrast, the decade prior to 1983 saw fewer than ten such products come to market. The poster child for orphan drugs is Amgen's Epogen which had sales of $2.4 billion in 2003[64], but which might not have been developed but for the Orphan Drug Act. Admittedly, the profitability of Epogen makes the orphan drug moniker a bit of a misnomer. The European Union has seen similar success with some of the orphan drugs it has developed. In the European Union, from April 2000 through June 2004, the European Commission had granted 204 orphan drug designations.[65]

The inherent problem with the orphan drug programs is that the programs are intended to provide subsidies to treat relatively rare conditions and diseases which have low incidence in the population. The rationale is that with low incidence, there is insufficient economic incentive to develop a drug to treat the disease. However, nothing in the orphan drug acts provides an incentive to develop drugs and therapies to treat conditions which have high incidence in third world populations but a low incidence in developed regions. Therefore, it is

60. Orphan Drug Act, 21 U.S.C. § 360ee (2007).

61. EMEA Human Medicines—Orphan Medicinal Products web site, http://www.emea.europa.eu/htms/human/orphans/incentives.htm (last visited Nov. 18, 2008); Commission Regulation 141/2000, 2000, O.J. (L18) 1.

62. STEPHEN SEGET, ORPHAN DRUGS TO 2008: UNDERSTANDING REGULATION AND MARKET OPPORTUNITY IN EUROPE (Urch Publishing 2005).

63. Orphan Drugs: Established by FDA to Expedite Patient Access to Medications, 60 AM. J. HEALTH—SYS. PHARM 339 (2003), *available at* http://www.medscape.com/viewarticle/449551_6; *see also,* Seget, *supra* note 62.

64. Seget, *supra* note 62.

65. *Id.*

not surprising that "out 'of the 1233 new drugs marketed between 1975 and 1999, only 13' were for diseases suffered in developing countries."[66]

V. Technology Transfer Opportunities and Mechanism for Developing Countries to Consider

A. Traditional Knowledge

Issues surrounding traditional knowledge present a unique challenge to the transfer of intellectual property. Not surprisingly, the view of developed countries toward the value of traditional knowledge is quite different than the view of developing countries.[67] For instance,

> poor countries have been told to preserve their . . . genetic resources on the off-chance that at some future date something is discovered which might prove useful to humanity . . . [They] are also told that the right will not agree to compensate the poor for their sacrifices. The poor are not asking for charity. When the rich chopped down their own forests . . . and scoured the world for cheap resources, the poor said nothing . . . Now the rich claim a right to regulate the development of poor countries. And yet any suggestion that the rich compensate the poor adequately is regarded as outrageous. As colonies, we were exploited. Now, as independent nations, [they] are to be equally exploited.[68]

Traditional knowledge does have the potential to make a valuable contribution toward innovation and can be used to promote technology transfer. However, by virtue of the fact that members of a particular culture have known traditional knowledge for an extended period of time, it does not fit neatly into the rubric of intellectual property protection as it is practiced in developed countries.[69] That is not to say that with some creative thinking developing countries

66. Nwabueze, *supra* note 23, at 389 (citing WORLD HEALTH ORG., GENOMICS AND WORLD HEALTH: REPORT OF THE ADVISORY COMMITTEE ON HEALTH RESEARCH (Nov. 25, 2003) *available at* http://www.who.int/gb/ebwha/pdf_files/EB111/eeb11112.pdf).

67. *See, e.g.,* Craig D. Jacoby & Charles Weiss, *Recognizing Property Rights in Traditional Biocultural Contribution*, 16 STAN. ENVTL. L.J. 74 (1997).

68. *Id.*

69. Mike Holderness, *Moral Rights and Authors' Rights: the Keys to the Information Age*, WARWICK-JILT, Feb. 27, 1998, http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1998_1/holderness/ (last visited Nov. 23, 2008).

cannot come up with a mechanism to leverage their traditional knowledge while advancing their economic development, as discussed more fully below.

B. Trademark Protection

A trademark has the potential to significantly impact the amount of direct foreign investment; it "is a more powerful economic development lever than trade."[70] In contrast to patented technology, which often requires know-how in addition to any disclosure in a patent application, trademarks primarily serve to identify goods in the minds of consumers. It has been argued that by providing better trademark protection, a company has "an incentive to invest in making their marks more recognizable and easier to remember."[71] This, in turn, can lead to a development of and investment in the local economy, which will create jobs.

C. Licensing In/Licensing Out – the IBM Model

There was a time when IBM followed the traditional closed shop thinking of many large multi-national companies: not interested if it was "not invented here," and it certainly would not let people at their intellectual property! Those days are long gone. IBM, a creature of many reincarnations in its quest for corporate survival, has become a lean, mean licensing machine. According to its web site, "[w]ith 13 consecutive years of U.S. patent leadership (having received more U.S. patents than any other company in the world), IBM is expanding its use of intellectual property to accelerate the adoption of open standards and open source software through creative licensing and stewardship programs."[72]

At first blush, the out-licensing of technology may seem counterintuitive as a business practice. After all, hard earned research and development dollars were spent working on a problem and then additional funds were spent protecting it. How, then, does letting another company use its technology advance IBM's corporate agenda or the bottom line? IBM is no fool. It is currently offering

70. Daniel J. Gervais, *Intellectual Property, Trade & Development: The State of Play*, 74 FORDHAM L. REV. 505, 521 (2005-06).

71. *Id.*

72. IBM Intellectual Property and Licensing, http://www.ibm.com/ibm/licensing/ (last visited Nov. 16, 2008).

free licensing to universities to foster open standard development,[73] and it is making licenses available to start-up companies.[74] IBM recognizes that by advancing technology it is increasing the number of people and businesses that rely on its technology, leading to the creation of a long-term, reliable revenue stream while maintaining a good public image. There is a method to IBM's madness, much like the method to Henry Ford's decision to pay his workers $5 a day so that they, in turn, could afford to buy the cars they were manufacturing.

There are many reasons why a company may ultimately make the business decision to license its intellectual property rights. Licensing affords the opportunity to essentially tap into the resources of the licensee to penetrate markets that the company might not otherwise be able to access.[75] Licensing also affords broadening the geographic reach of a company into new geographic markets and potentially broadens product markets.[76] Licensing into a non-competing field can also provide easy access to revenue. In many instances, the license is a tool for bartering with another company.[77]

While out-licensing technology has been a good idea for IBM, applying that practice to technology transferred to developing countries presents cultural and technical hurdles. However, these are likely hurdles that can be overcome with creative thinking and planning.

VI. Is That All She Wrote?

Perhaps not. Although, there is evidence that suggests that "the number of patents issued within a nation tends to rise with the size and the level of economic development,"[78] there are also examples of countries that have used other techniques to change their position in the world economy.

73. *See,* http://www-03.ibm.com/press/us/en/pressrelease/21846.wss (last visited Dec. 28, 2008).

74. Dawn Kawamoto, *IBM Woos Start-Ups*, CNET, Dec. 13, 2005, http://news.cnet.com/2102-1011_3-5993221.html?tag=st.util.print.

75. JAY DRATLER, LICENSING OF INTELLECTUAL PROPERTY § 1.03 (Law Journal Press 2002) (1994).

76. *Id.*

77. *International Licensing of Intellectual Property: The Promise and the Peril*, 1 J. TECH. L. & POL'Y 1 (1996), *available at* http://grove.ufl.edu/~techlaw/vol1/gikkas.html.

78. Padraig Dixon & Christine Greenhalgh, *The Economics of Intellectual Property: A Review to Identify Themes for Future Research*, OXFORD INTELLECTUAL PROPERTY RESEARCH CENTRE, Nov. 2002, http://www.oiprc.ox.ac.uk/EJWP0502.pdf.

A. Ireland and Its Influence on El Salvador

Ireland, essentially a third world country in the 1980s with its educated work force emigrating to find jobs, has, with the creation of economic incentives and intellectual property rights, provided a haven for companies to invest and has transformed itself from one of the poorest countries in Europe to one of the richest.[79] Over time, every major medical device and pharmaceutical company in the United States set up an operation in Ireland. As a result, the Irish economy boomed, her native sons and daughters were wooed back from abroad, and she took on the mantle of the Celtic Tiger during the 1990s through 2001. Incentives for setting up in Ireland included her membership in the European Union, her low corporate tax rate, relatively low wages for skilled workers, and a highly educated English-speaking work force. Ireland's progress may be a result of many things, but at a minimum she illustrates the ability of a country through good policy and external investment to turn itself around in a relatively short time period.

Seeking to follow Ireland's success, El Salvador has adopted the Irish model of developing workforce skills as opposed to focusing on increasing domestic research funding. El Salvador's economy is a United States dollar-based economy. El Salvador is in the process of revitalizing her economy, looking toward Ireland's example and leveraging her geographic proximity to the United States. In a recent speech, Vice President Ana Escobar "outlined four pillars for national education reform—increasing the number of years children attend schools, strengthening math and science curricula, moving towards bilingualism and providing students with access to technology before they graduate high school."[80] If all goes according to plan, El Salvador will follow in Ireland's footsteps to become a Central American Cinderella story within the next 10 years.

B. Bioprospecting, Done Right

As alluded to above, many developing countries have a wealth of traditional knowledge or biological diversity that itself could provide

79. *See* Benjamin Powell, *Markets Created a Pot of Gold in Ireland*, CATO INSTITUTE, Apr. 15, 2003, http://www.cato.org/pub_display.php?pub_id=3070.

80. Christian Martell, *Vice President of El Salvador Speaks on Fighting Poverty*, THE BROWN DAILY HERALD, Apr. 11, 2007, http://media.www.browndailyherald.com /media/storage/paper472/news/2007/04/11/CampusNews/Vice-President.Of.El. Salvador.Speaks.On.Fighting.Poverty-2834470.shtml.

incentive for transfer of technology. Not surprisingly, there is a wealth of criticism over the extent to which these riches are protected. It has been argued that

> knowledge and natural resources cultivated by indigenous peoples over generations serve as free or low-cost inputs into the proprietary industrial knowledge production process. This . . . enables multinational corporations to claim protection, such as patents, on 'purified' natural substances, by using expensive technology usually not available to developing states.[81]

Unchecked, the conversion of information and resources by developed countries has the potential to create a new form of colonization by developing countries.[82]

With all the hand-waving over biopiracy and the activities of large companies from developed countries stealing the traditional knowledge of local inhabitants from developing countries, the point that local governments should have the ability to control what occurs within their borders is often ignored. "Local governments, not foreign bioprospectors, hold primary responsibility for environmental damage attributable to the collection of biological specimens."[83] So, too, local governments have the power to control the manner in which materials are taken and in which their populace is compensated. Costa Rica leverages its natural resources and has developed processes for ensuring sustainability.[84] Even if local governments are not willing to take control, developed countries can, and should, provide incentives for developing countries to exercise their sovereign rights.

VII. Conclusion

On balance, it would seem that intellectual property rights have a positive impact on the economic development of a country. Even

81. Bradford S. Simon, *Intellectual Property and Traditional Knowledge: A Psychological Approach to Conflicting Claims of Creativity in International Law*, 20 BERKELEY TECH. L.J. 1613, 1618 (2005).

82. VANDANA SHIVA, PROTECT OR PLUNDER?: UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS 49 (2001).

83. Jim Chen, *There's No Such Thing as Biopiracy . . . and It's a Good Thing*, 37 MCGEORGE L.REV. 1, 13 (2006).

84. *See*, National Biodiversity Institute, Costa Rica, http://www.inbio.ac.cr /en/default.html.

Dessemontet acknowledged in his speech that "there is a strong correlation between the rate of patents sought by enterprise and the general level of economic developments."[85] However, it would be shear arrogance to presume that a one-size-fits-all approach toward intellectual property protection will and should work for developing countries. As noted by Sir Hugh Laddie,

> [f]or too long intellectual property rights have been regarded as food for the rich countries and poison for poor countries . . . Poor countries may find them useful provided they are accommodated to suit local palates. The . . . appropriate diet for each developing country needs to be decided on the basis of what is best for its development, and that the international community and governments in all countries should take decisions with that in mind.[86]

In our fast paced world driven by immediate gratification, it is convenient to try to find a magic bullet, the one thing that presents an obstacle to achieving an objective. Reality is much more difficult. As a practical matter, intellectual property rights present hurdles for technology transfer to developing countries. However, there are other forces in the mix as well. That is not to say that these forces cannot be overcome with thought and creativity and, as suggested by Sir Laddie, by accommodating the rights to fit the local palates.

85. François Dessemontet, Professor, Schools of Law of Lausanne and Fribourg, address at the WIPO Geneva Conference (Nov. 17, 2003), *available at* http://www.wipo.int/documents/en/meetings/2003/wipo_wto/presentations/doc/dessemontet. doc.

86. Hugh Laddie, Commission on Intellectual Property Rights Foreword, http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf (last visited Dec. 21, 2008).

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